Temporal and spatial association between human psittacosis in the general population and poultry farming in the Netherlands, 2000 – 2013

Introduction
Psittacosis is a relatively unknown zoonotic disease, highly under diagnosed and commonly linked to psittacine birds. Psittacosis is also endemic in poultry, but the risk for people in the surrounding areas is unknown. Therefore our study aimed to explore the possible spatial and temporal association between human psittacosis infections in the general population and poultry farming in the Netherlands from 2000 – 2013.

Discussion
• Large cluster in a big poultry production area “the Gelderse vallei”
• 2 seaside city clusters → pet birds, ring-necked parakeets or wild birds? (pigeons, gulls)
• Limitation: Possible distortion by awareness and diagnostic methods

Data
Notified human cases of psittacosis in The Netherlands, reported from 2000 – 2013
• Inclusion criteria: valid postal code (PC4) → N=657

Individual poultry farm information from agricultural census (2012)
• Inclusion criteria for farms: >=500 birds (exclude hobby farmers)

Spatial association between psittacosis infection notifications and poultry
• Only cases not related to known outbreaks included (N=621)
• Poisson regression analyses on a municipality level
• Correcting for spatial autocorrelation using the INLA approach within R (Bayesian)
• Nested structure of independent variables → specific ‘level-based’ model selection (based on DIC)

Table a: Final multivariable model with rate ratios (RR) and 95% credibility intervals (CI) for psittacosis infection notifications in the Netherlands, 2000 – 2013. A random effect term was added to account for spatial autocorrelation. N=415 municipalities (2012).

Discussion
• Chicken slaughterhouses and slaughter duck farms were found to be associated with human psittacosis in the general population
• C.psittaci found in air samples slaughterhouses (Dicks & Vanrompay, JMM, 2011)
• Stressed chickens excrete more C.psittaci (Harkinezhad et al, VM, 2009)
• Chickens enter slaughterhouse in open crates (possible easy contamination of the environment)
• C.psittaci shown to have a preference for ducks (Hulin et al, FEMS, 2015)
• Limitations: possible noise due to spatial issues (for example contamination outside the municipality), poultry information used from one specific year, only 15 municipalities with chicken slaughterhouses (power issues)